ABSTRACT

The effects of adding *Lactobacillus plantarum* to green tea water extract (*Camellia sinensis*) on increasing of its antibacterial activity

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Green tea water extract (GTWE) is rich in polyphenols that can be used as antibacterial. However, polyphenols are not completely absorbed and *Lactobacillus plantarum,* act as probiotic, can metabolized it and has synergistic effect of antibacterial activity with GTWE. The aims of this study was to assess the effect of *Lactobacillus plantarum* addition on antibacterial activity of GTWE. The green tea leaf from PTPN XII Lawang was used as sample of this experiment. MICs and co-culture of combination GTWE and *Lactobacillus plantarum* FNCC-0027 were measured. In co-culture studies, antibacterial activity the combination of *Lactobacillus plantarum* FNCC-0027 and GTWE was observed against both *Staphylococcus aureus* and *Escherichia coli*.

The results showed that the *Lactobacillus plantarum* growth was not affected by GTWE, and antibacterial activity the combination of *Lactobacillus plantarum* FNCC-0027 and GTWE was significantly increase. We found that MICs of GTWE against *Staphylococcus aureus* (3200 $\mu g.mL^{-1}$) were considerably lower than those against *Escherichia coli* (6300 $\mu g.mL^{-1}$). The diameter inhibitory zone of GTWE in combination with *Lactobacillus plantarum* FNCC-0027 is longer than *Lactobacillus plantarum* or GTWE used separately. As probiotics and the green tea are derived from natural products, treatment with these agent may represent alternatives to antibacterial therapy.

Keywords : Green tea water extract, *Lactobacillus plantarum*, antibacterial activity